

Energy Efficiency for the Nunamiut People of Anaktuvuk Pass, Alaska

Tribal Energy Program

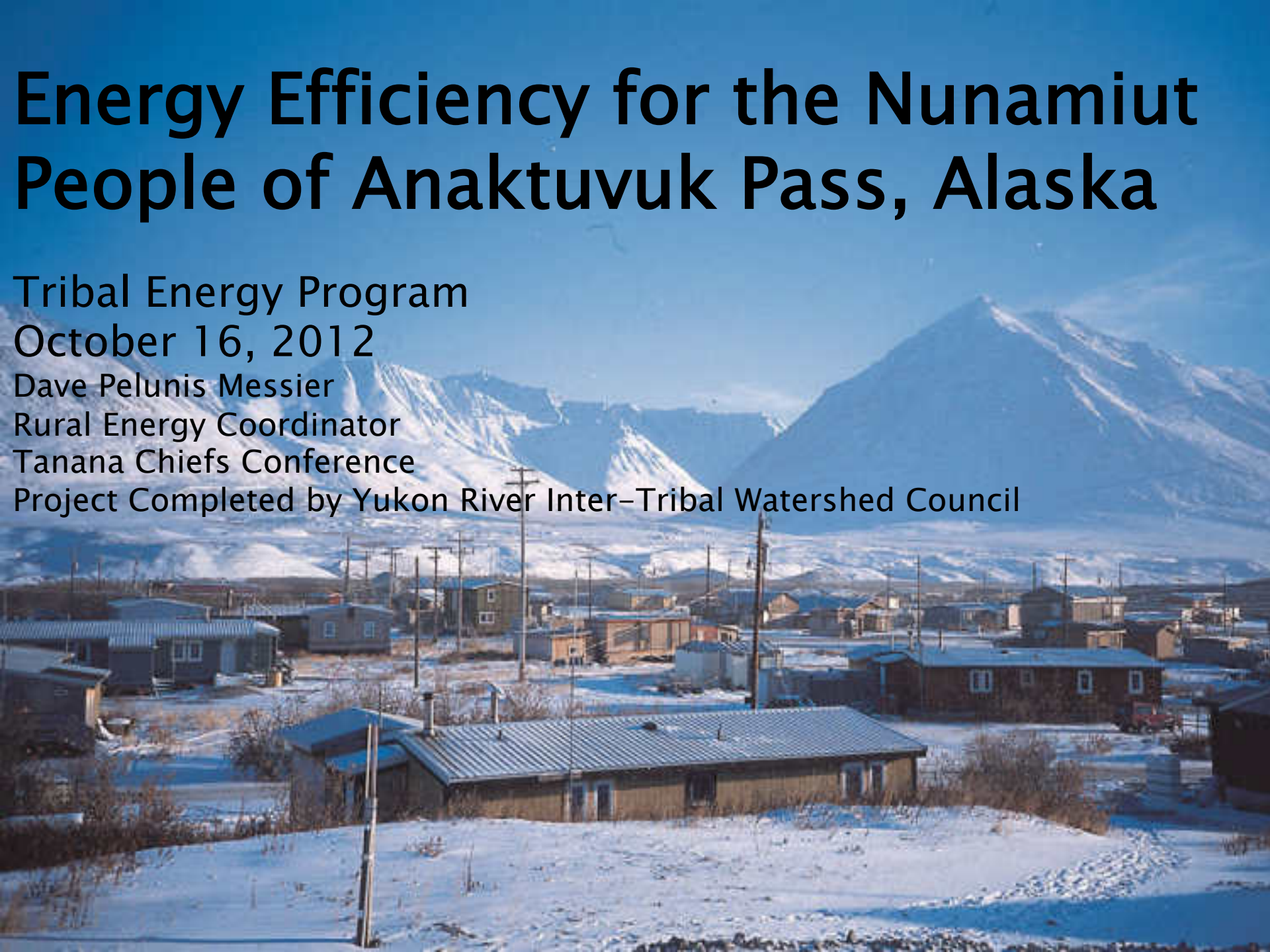
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Dave Pelunis Messier

Rural Energy Coordinator

Tanana Chiefs Conference

Project Completed by Yukon River Inter-Tribal Watershed Council



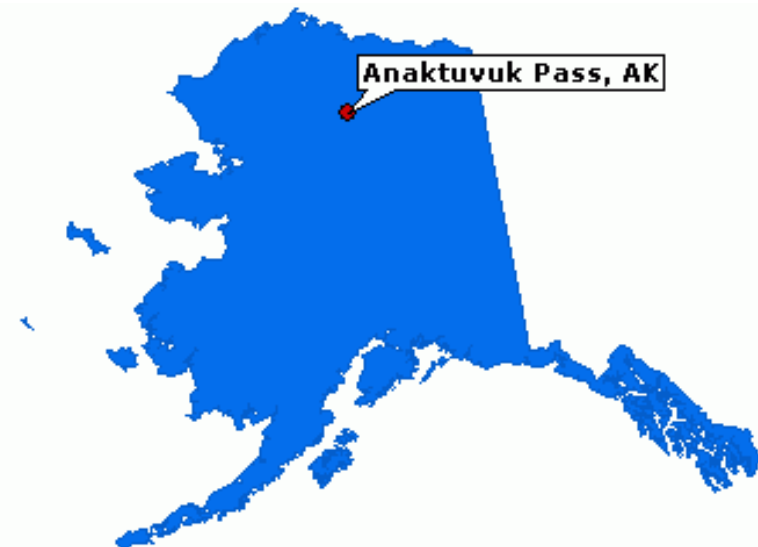


Nunamiut Corporation

- ▶ Nunamiut People– Inland Eskimo of Alaska
- ▶ Anaktuvuk – *place of caribou droppings*
- ▶ Corp = The Local Wal-Mart
Hardware Store, Bank, Grocery Store, Restaurant, Hotel, Gas Station, radio station
- ▶ Energy:
\$.20–\$.35/kWh, \$9.25/gal oil

But let's be serious....

$\$8\text{gal}/13.8\text{kwh} = \$.579/\text{kWh}$



Buildings

- ▶ Village Store – 6,000 sq ft
 - ▶ Village Restaurant (4,200 sq ft)
 - ▶ Corporation Office/Hotel
 - ▶ Managers House (732 sq ft)
 - ▶ Nunamiut Corp Shop (7,000 sq ft)
- 

Project Goals:

1. Reduce Energy Consumption in Corp. Buildings
2. Save Nunamiut Corp \$
3. Involve the Community in Energy Efficiency—quantify and report results from the project

**LOOK UP!!!
SOMETHING'S DIFFERENT...**

15 Watts!

40 Watts!





The New Lights in the Anaktuvuk Pass Store use LED technology to save energy AND money. Each bulb uses less than HALF the energy of an equivalent florescent bulb and contains NO harmful Mercury or other chemicals

Bottom Line - These lights will Save Nunamiut Corp \$4,000-\$5,000 each year in electrical costs and keep 1,000 gallons of diesel from being burned in the village generators!

Nunamiut Corporation, the Yukon River Inter-Tribal Watershed Council, the Arctic Slope Community Foundation and the Department of Energy Tribal Energy Program are working together to lower the Energy Consumption of Nunamiut Corporation buildings in Anaktuvuk Pass. This lighting upgrade is just one of the pieces of our project. If you have questions on how to save energy in your home please call or e-mail the YRITWC Energy Department using the contact information below !

Ph: 907-451-2530 E-mail: dpm@yritwc.org

With your help we're making our villages more sustainable!

How Do We Achieve These Goals?

- ▶ LED Lighting, Efficient Controls
- ▶ High Efficiency Furnaces
- ▶ Improved Building Shell

How much is this timer worth



Economics and Energy Education

Payback on Lights:

T-12 Electromagnetic:

# of Bulbs:	X	kW (consumed during use)	X	Hrs/Day	X	Days/yr	=	kWh/yr	X	kWh Rate	=	Cost/yr	/	# Units	=	Operating cost- per bulb for 1yr
132	X	.04	X	10	X	350	=	18,480	X	\$.35/kWh	=	\$6,468	/	132	=	\$49.00

LED Bulbs:

# of bulbs:	X	kW (consumed during use)	X	Hrs/Day	X	Days/yr	=	kWh/yr	X	kWh Rate	=	Cost/yr	/	# Units	=	Operating cost- per bulb for 1yr
132	X	.015	X	10	X	350	=	6,930	X	\$.35/kWh	=	\$2,425.5	/	132	=	\$18.375

Expected Bulb Lifespan= 50,000 hrs
@ 10hrs/day : 14 years

Estimated SAVINGS by switching from t-12 to LED : \$4,043/yr

Savings per bulb \$30.62/yr

Payback per bulb (labor not included) = 1.6 yrs

Estimated Savings per bulb over 14 yr lifetime = \$428.68/bulb x 132bulbs = \$56,585.76

Insulate and Seal

- ▶ Triple Pane Windows in the Restaurant
- ▶ Blow in Cellulose
- ▶ Caulk and Seal



The Village Store

- ▶ Yearly Utility Cost to operate 3,200 sq ft store: \$60k
- Can anybody guess what the majority of that \$ is being spent on?



The Village Restaurant

- ▶ Yearly Utility Cost to operate 4,200 sq ft restaurant – \$45K
 - Insulation
 - Heat Trace
 - Windows/Doors



Corporation Office

- ▶ Yearly Utility Cost to operate Corp Office/Hotel building – \$30K
 - Insulation
 - Sealant
 - Minimizing Load
 - Efficient Use of Space



Nunamiut Corp Shop

Original setup

▶ 12 x 400 watt/ HID Highbay = ? kW



Option 1: Replace with t5

▶ 12 x 324 watt/fixture t5 = ? kW



Option 2: Replaced with LED Highbay

12 x 120 watt/LED highbay = ? kW



Nunamiut Corp Shop

Original setup

- ▶ 12 x 400 watt/ HID Highbay = 4.8 kW
 $4.8 \text{ kW} \times 6000 \text{ hrs} \times .25 / \text{kWh} = \underline{\$7,200}$



Option 1: Replace with t5

- ▶ 12 x 324 watt/fixture t5 = 3.88 kW
 $3.88 \times 6000 \text{ hrs} \times .25 / \text{kWh} = \underline{\$5,820}$



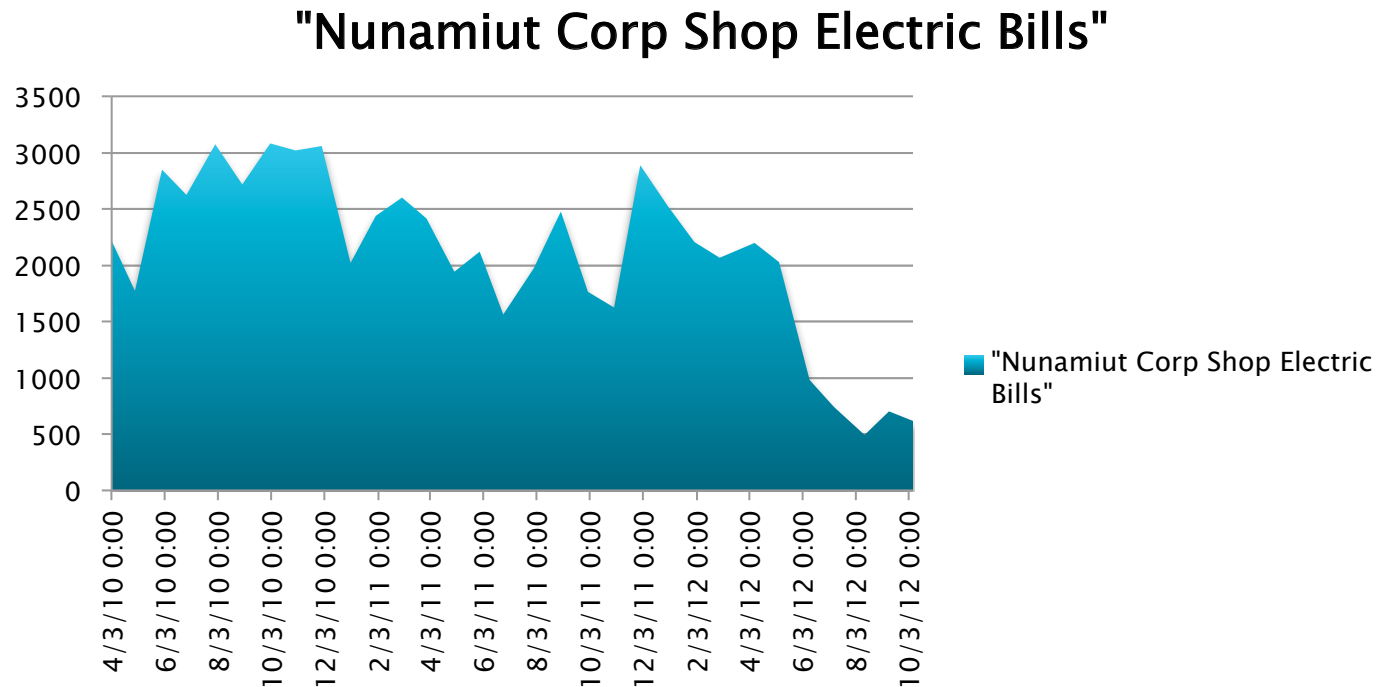
Option 2: Replace with LED Highbay

- ▶ 12 x 120 watt/LED highbay = 1.44 kW
 $1.44 \times 6000 \text{ hrs} \times .25 = \$2,160$



Nunamiut Shop Electric Bills

Can you guess when we changed the lights?



RESULTS

<u>Building</u>	<u>5 yr \$ Savings</u>	<u>Cost of Materials</u>	<u>5 yr kWh Savings</u>
Corp Office	???	???	???
Store	???	???	???
Shop	???	???	???
Restaurant	???	???	???
TOTAL	???	???	???

Gallons of Diesel Saved at 13.8kWh/gal:
 30,029 Gal
 @ \$8/gal = \$240,233

Comparison...

- ▶ 4.4 kW solar array in Nenana, AK
 - installed cost of ~\$5/watt = ~\$20k
 - 5,100kwh/yr production
 - 5 year energy production: 25,500 kWh's
 - At Anaktuvuk Pass rates: 11 yr payback period



Thank you

QUESTIONS?

